

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
10 June 2004 (10.06.2004)

PCT

(10) International Publication Number  
**WO 2004/049025 A1**

(51) International Patent Classification<sup>7</sup>: **G02B 6/16**

(21) International Application Number:  
PCT/DK2003/000804

(22) International Filing Date:  
24 November 2003 (24.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
PA 2002 01812 23 November 2002 (23.11.2002) DK

(71) Applicant (for all designated States except US): **CRYSTAL FIBRE A/S** [DK/DK]; Blokken 84, DK-3460 Birkerød (DK).

(72) Inventors; and  
(75) Inventors/Applicants (for US only): **BROENG, Jes**

[DK/DK]; Trudeslund 14, DK- 3460 Birkerød (DK).  
**KRISTIANSEN, René, Engel** [DK/DK]; Tibbevangeln 85, Hareskovby, DK-3500 Værløse (DK).

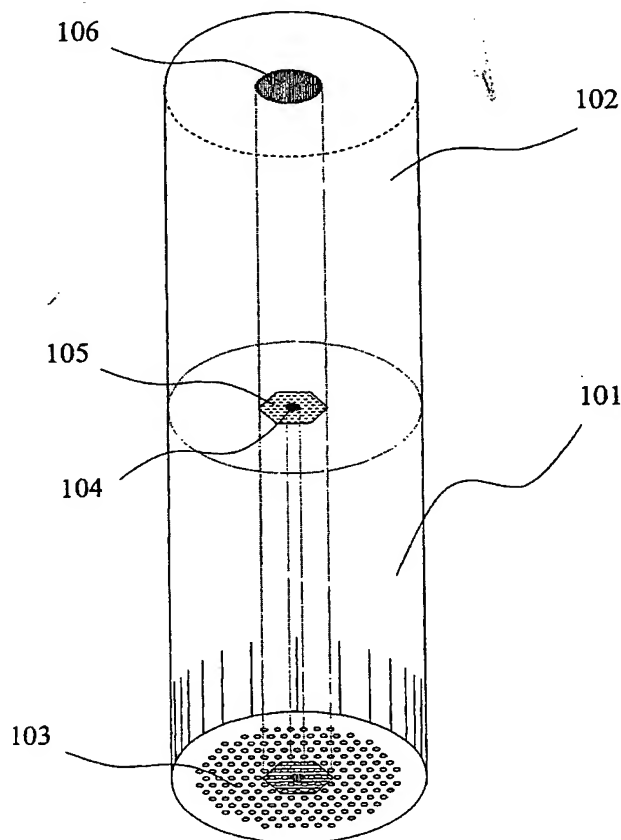
(74) Agent: **NKT RESEARCH & INNOVATION A/S**; Group IP, Blokken 84, DK-3460 Birkerød (DK).

(81) Designated States (national): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, EG, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK (utility model), SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: **SPLICING AND CONNECTORIZATION OF PHOTONIC CRYSTAL FIBRES**



(57) Abstract: A method of coupling a spliceable optical fibre for transmission of light in its longitudinal direction to an optical component, the method comprising (A) providing the spliceable optical fibre, said spliceable optical fibre comprising: (a) a core region (10, 20, 25, 30, 110); and (b) a microstructured cladding region, said cladding region surrounding said core region and comprising: (b1) an inner cladding region with inner cladding features (13, 22, 112) arranged in an inner cladding background material (11, 21, 111) with a refractive index  $n_1$ , said inner cladding features comprising thermally collapsible holes or voids, and (b2) an outer cladding region with an outer cladding background material (12, 24, 114) with a refractive index  $n_2$ ; said spliceable optical fibre having at least one end; (B) collapsing said thermally collapsible holes or voids by heating said least one end of said spliceable optical fibre; and (C) coupling said collapsed spliceable optical fibre end to the optical component. A spliceable optical fibre; a preform for producing a spliceable optical fibre; a method of producing a spliceable optical fibre comprising drawing of the preform; a heat-treated spliceable optical fibre; an article comprising a spliceable optical fibre is further disclosed.